

WHAT IS CLAIMED IS:

1. A post-treatment product and process for making a water-resistant polymeric coating or a strongly-swellable polymeric gel which comprises providing a stable, aqueous two-phase polymeric composition by the steps of forming a reaction mixture in a reaction vessel of a water-soluble vinyl monomer, optionally with one or more water-soluble comonomers, a predetermined amount of a first crosslinking agent, and water, heating the mixture, then periodically adding a predetermined amount of an initiator, and polymerizing at about 30-130°C, optionally removing said resultant two-phase composition from the reaction vessel, adding a predetermined amount of additional crosslinker or proteinaceous compound thereto, optionally coating the mixture onto a support, and optionally heating to further polymerize the mixture.
2. A process according to claim 1 in which said mixture is coated onto a polyester film.
3. A process according to claim 1 which is further polymerized at about 100°C.
4. A process according to claim 1 in which at least 0.02% by weight of additional crosslinker is added to the two-phase composition.
5. A process according to claim 1 in which an additional proteinaceous compound is added to the two-phase composition.
6. A process according to claim 1 further including the step of diluting with water and/or alcohol during or after the initial polymerization.

7. A process according to claim 1 in which said first crosslinking agent is present in an amount of 0.02-0.5 wt.% based on monomers.
8. A process according to claim 7 wherein said crosslinker is PETE or PETA.
9. A process according to claim 1 wherein said initiator is an azo initiator.
10. The product of the process of claim 1 which is a water-resistant coating on a substrate.
11. The product of claim 10 which is a water-resistant ink-jet film.
12. The product of the process of claim 1 which is a strongly-swellable gel.